



Chapter 6 Halohydrocarbon

通式:R-X





一、 Classification:

按烃基不同

卤代烷

卤代烯烃

卤代芳烃 **Ar-X**

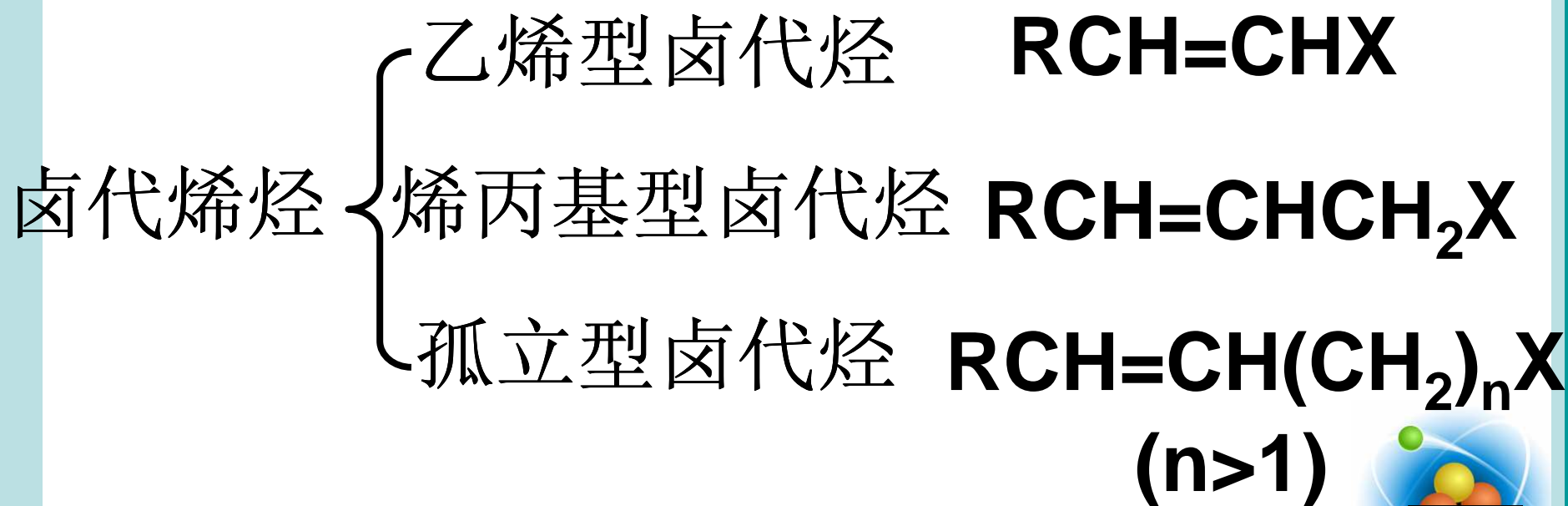
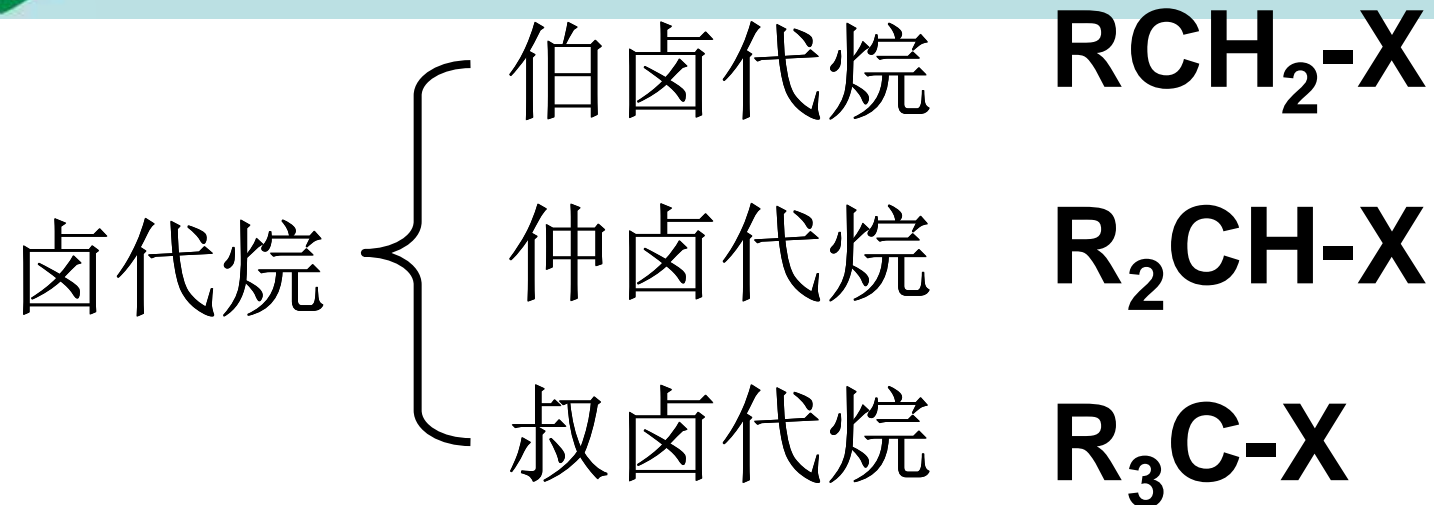
芳香卤代烃 **Ar(CH₂)_nX**

按卤素数目不同:

一卤代烃

多卤代烃







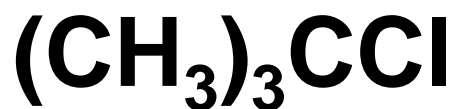
二、 Nomenclature:

1、简单的卤代烃:

“卤某烃”或“某烃基卤”



溴乙烷



叔丁基氯



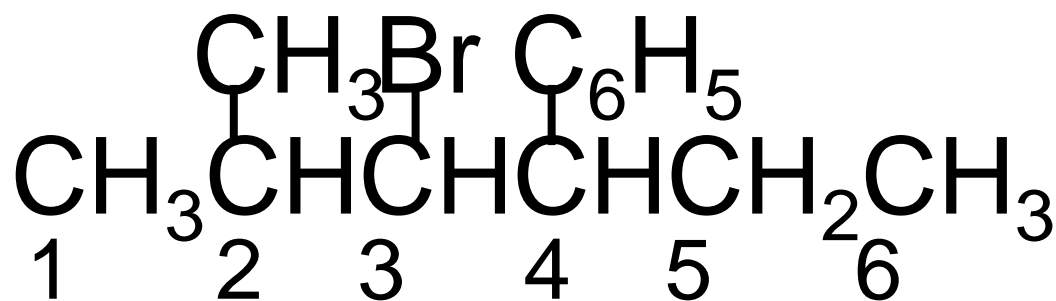
苄基氯





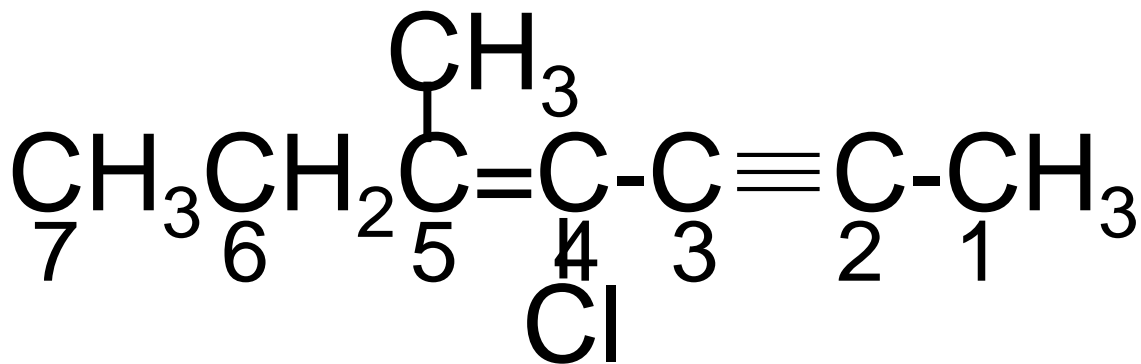
2、复杂的卤代烃：（系统命名法）

特点：卤素作为取代基



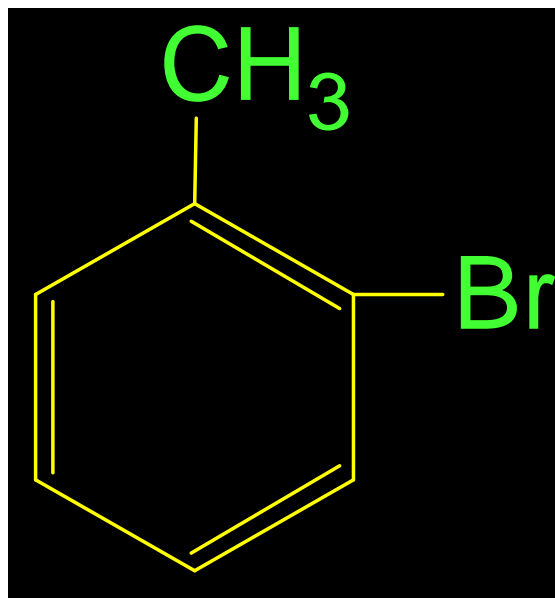
2-甲基-4-苯基-3-溴己烷



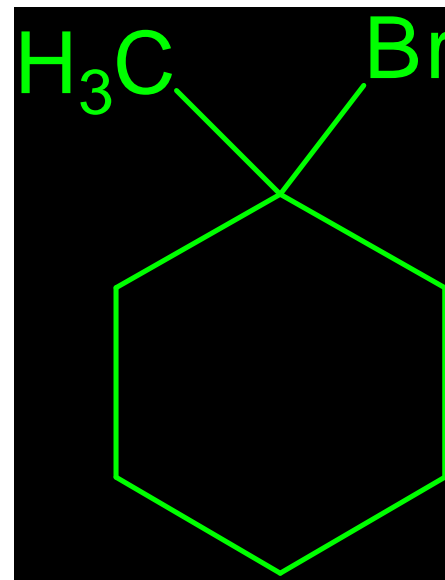


5-甲基-4-氯-4-庚烯-2-炔





2-溴甲苯
(邻-溴甲苯)

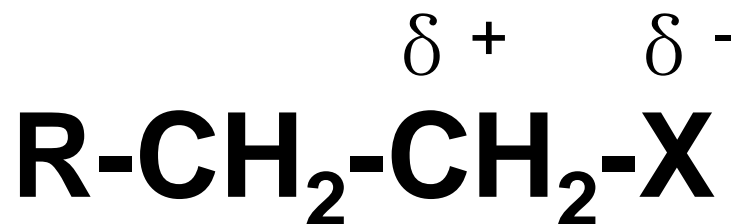


1-甲基-1-溴环己烷





三、 Chemical Properties :



亲核取代反应

(Nucleophilic Substitution Reaction)

消除反应

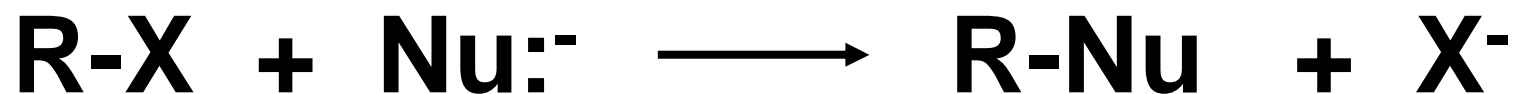
(Elimination Reaction)





1、亲核取代反应

反应通式：



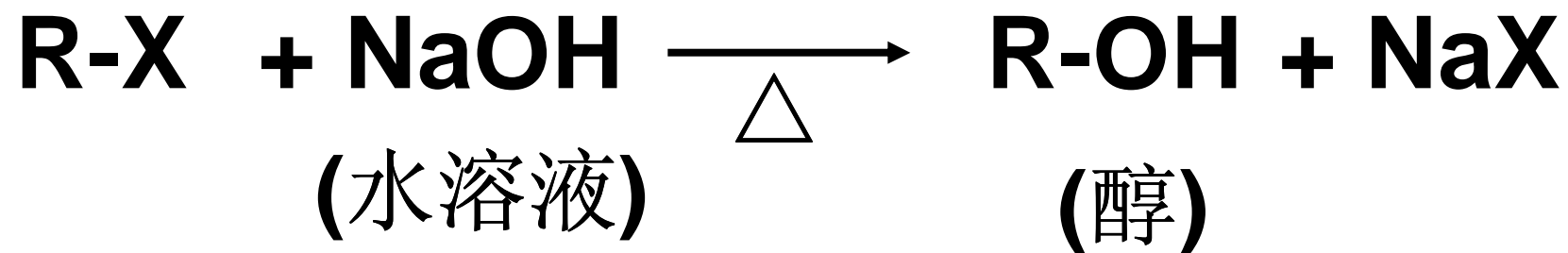
(底物) (亲核试剂) (产物) (离去基团)

常见的亲核试剂：





① 卤素被羟基取代

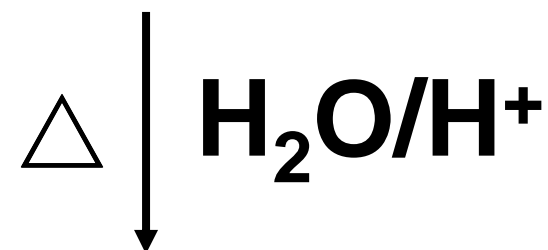
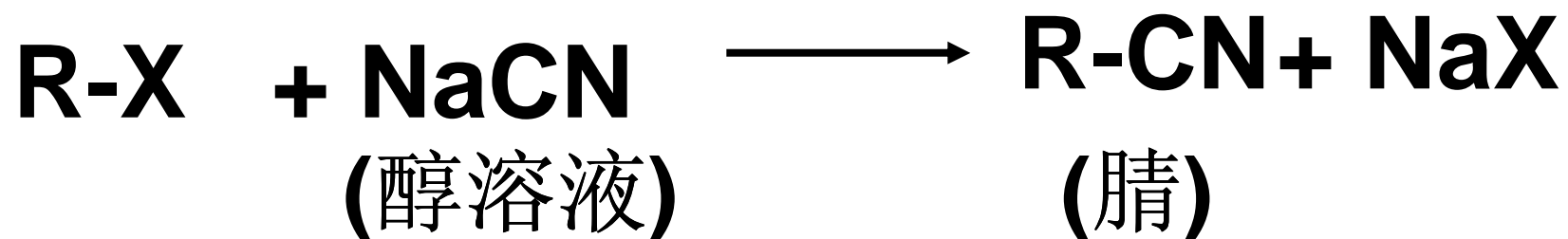


可用卤代烃制备醇





② 卤素被氰基取代

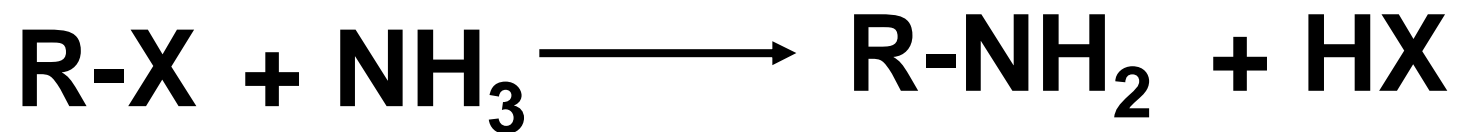


此反应可增长碳链

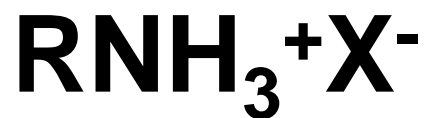




③ 卤素被氨基取代



(胺)

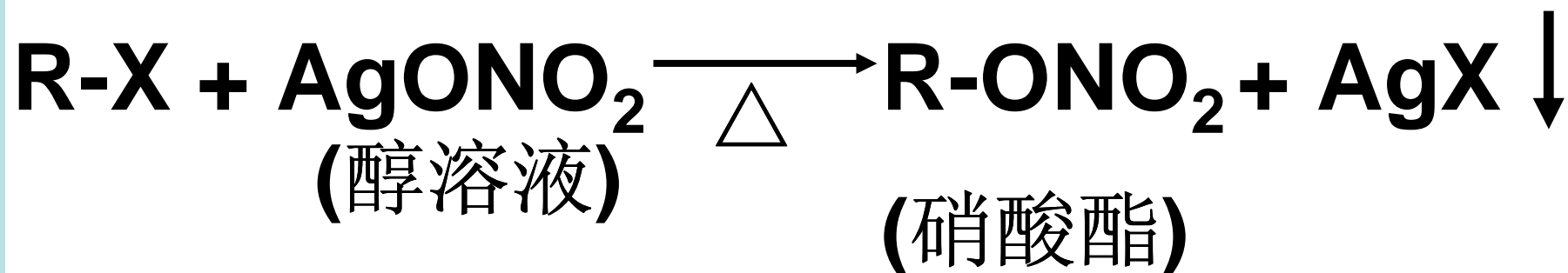


(铵盐)





④ 卤素被硝酸根负离子取代



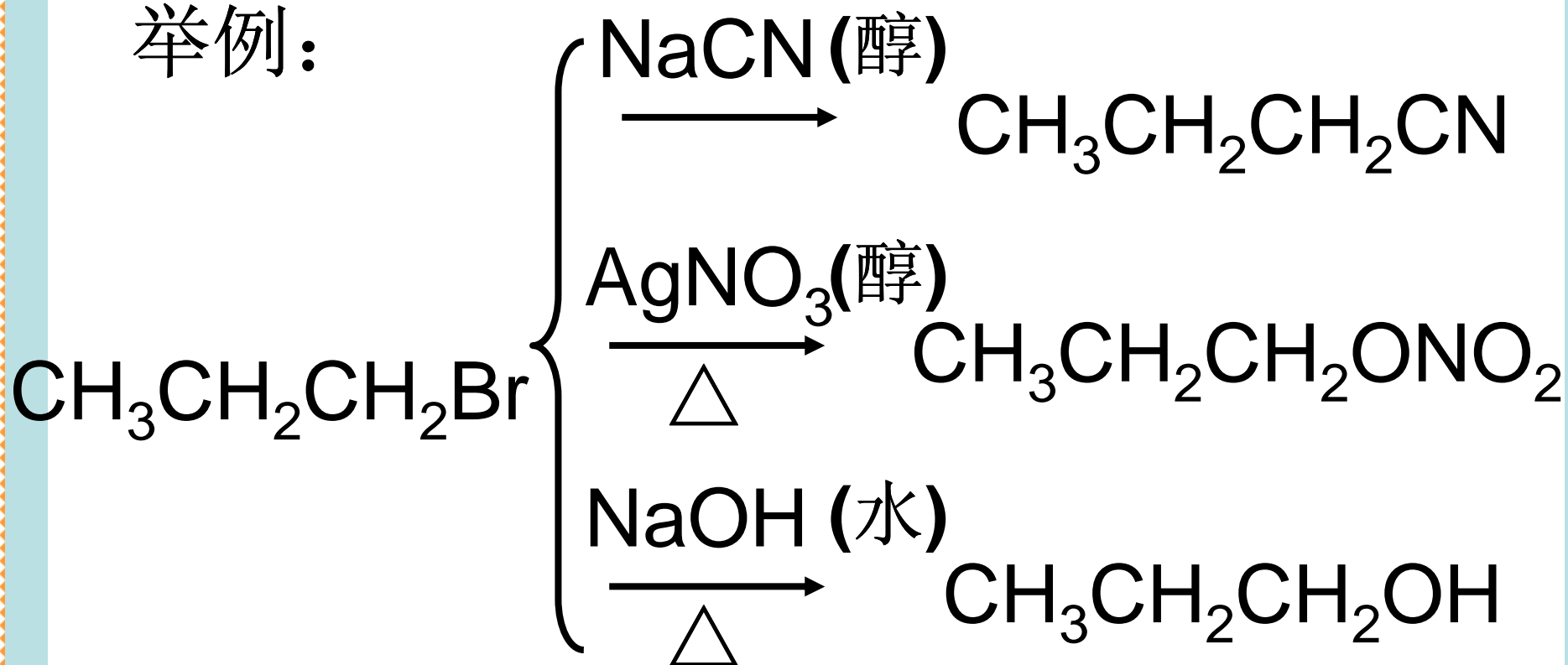
AgCl(白色) AgBr(浅黄色) AgI(黄色)

此反应可用于物质的鉴别





举例：





2、消除反应

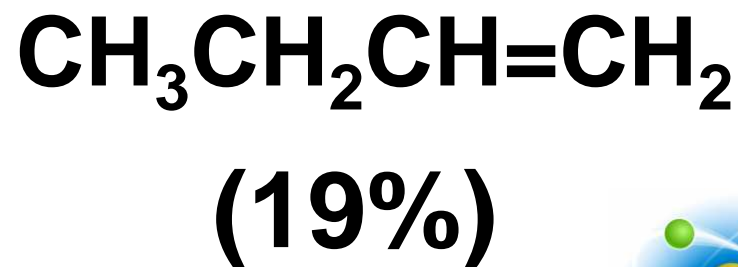
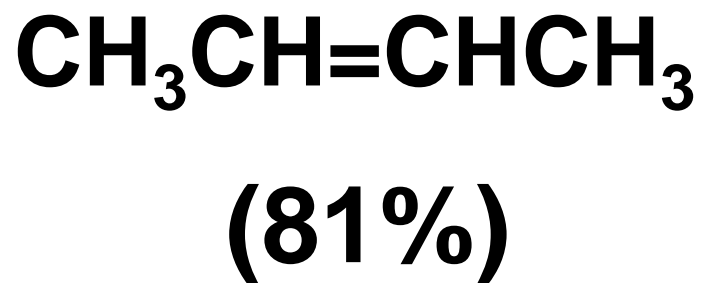
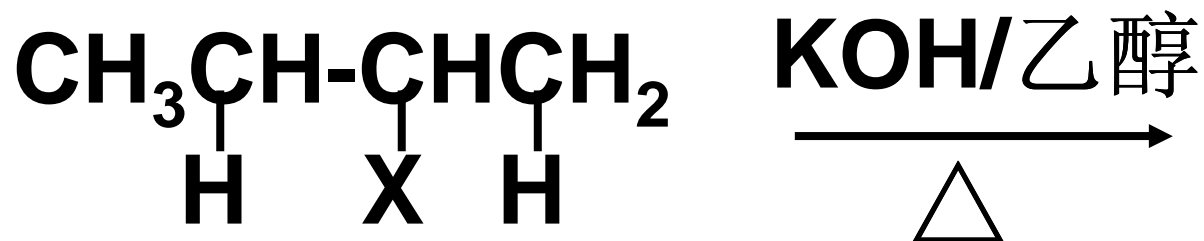
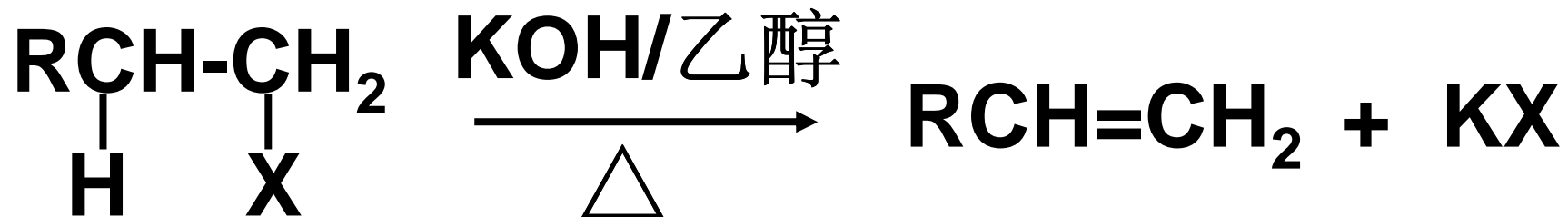
(卤原子与 β -H 同时离去, 形成烯烃.)

此反应叫消除反应, 也叫 β -消除反应)

消除反应的反应条件:

碱性、醇溶液、加热







结论：

(Sayteff)取向规则：

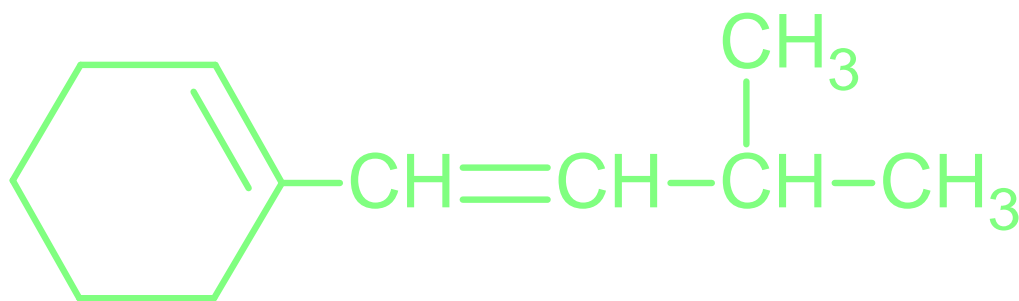
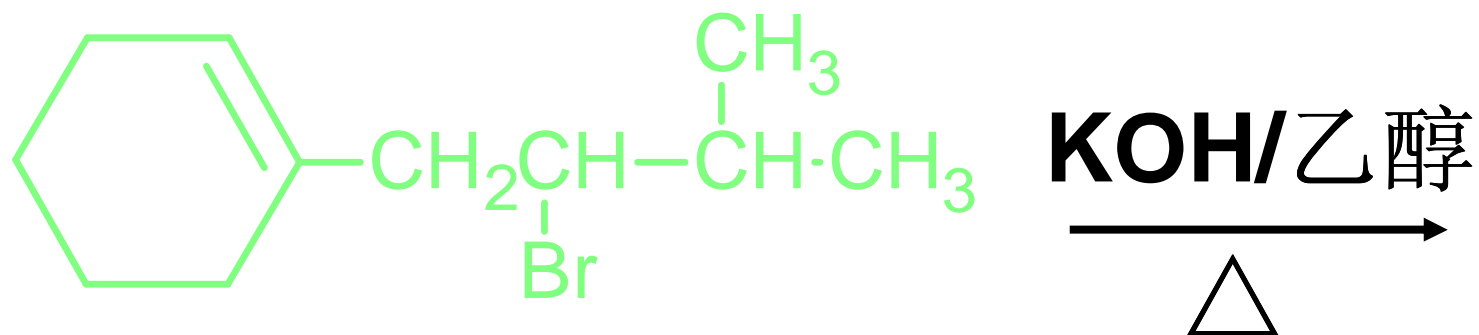
发生消除反应时，一般易生成双键碳原子上所连烃基最多的烯烃。

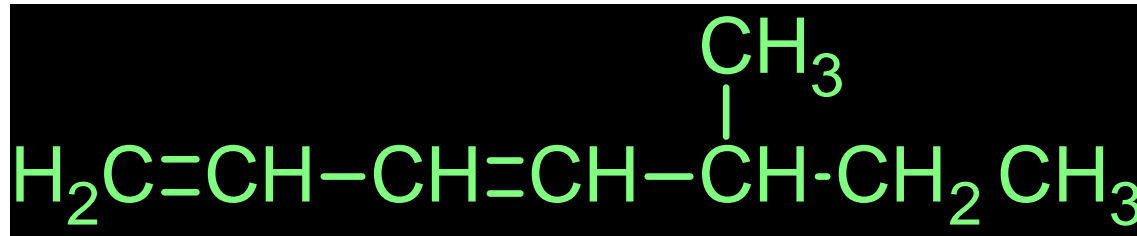
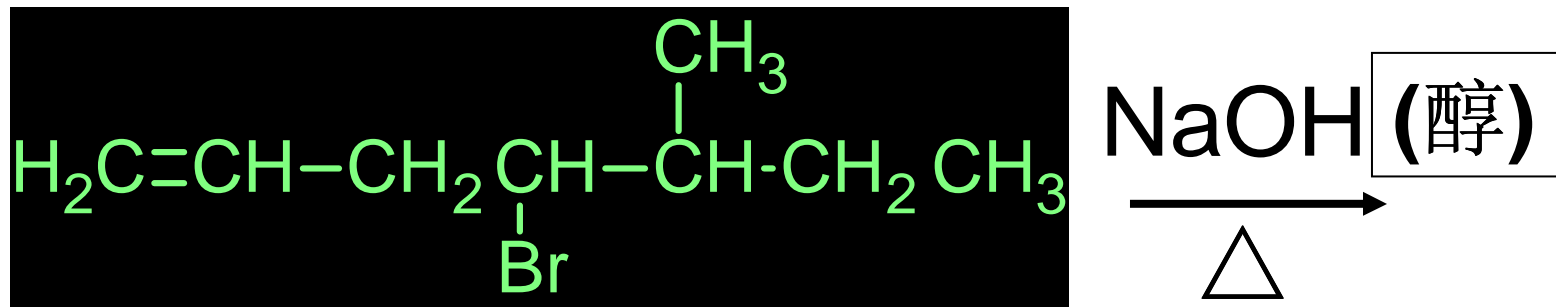
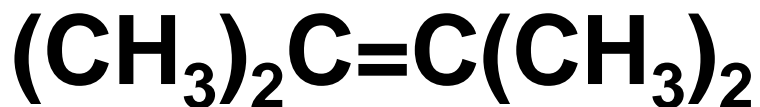
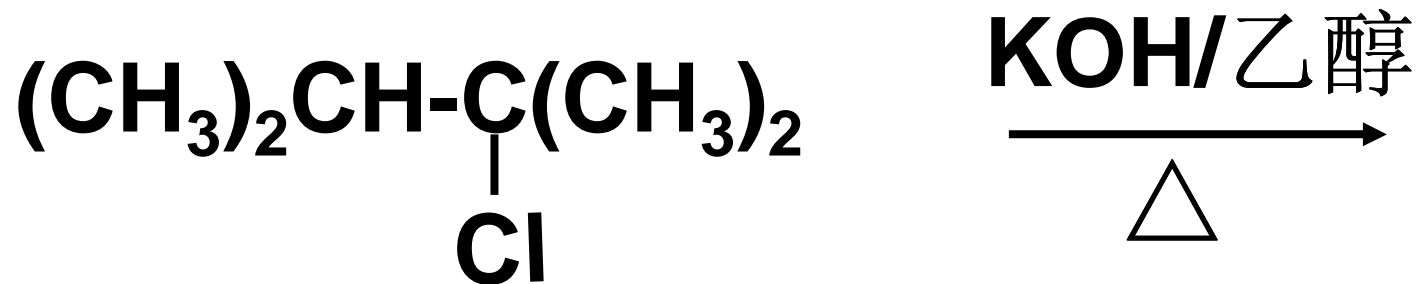
实质：生成最稳定的烯烃。





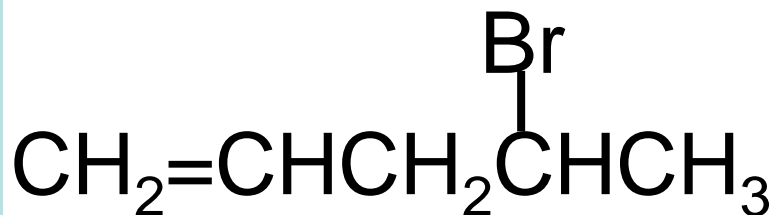
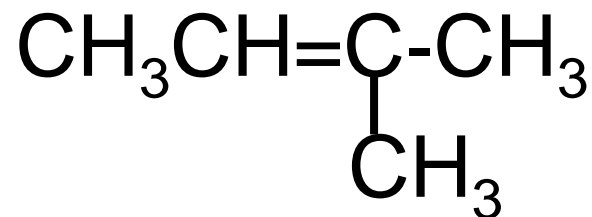
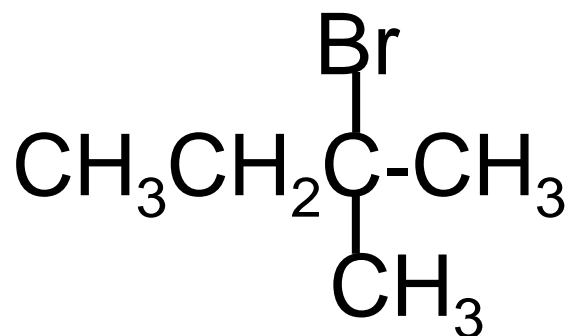
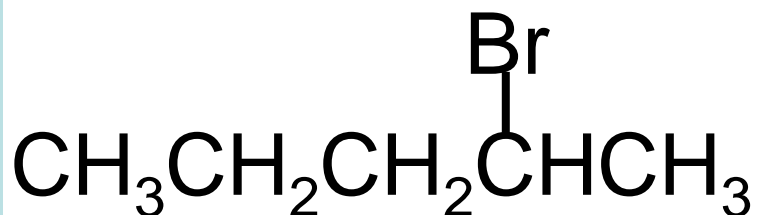
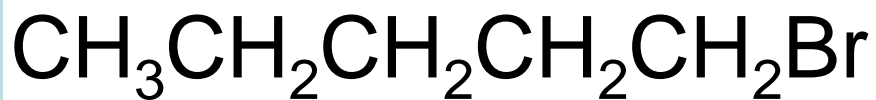
举例：







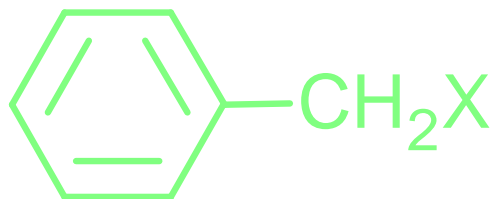
比较下列化合物的消除反应的活性:





四、卤代不饱和烃的亲核取代反应活性：

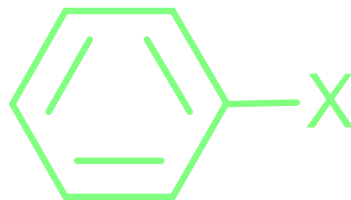
烯丙基型 \approx 苄基型



孤立型



乙烯型 \approx 卤代苯



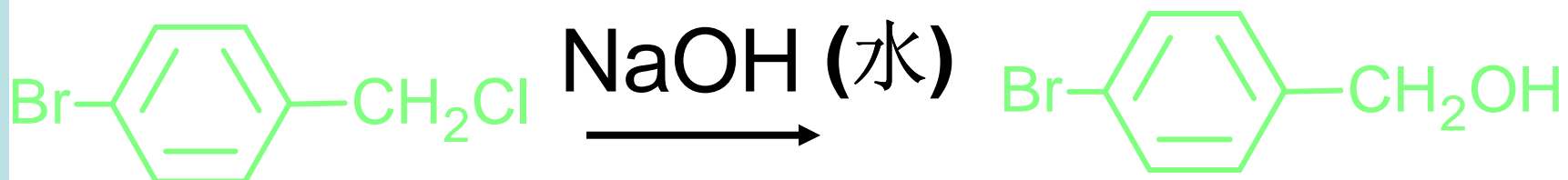
(不发生亲核取代反应)

大

小

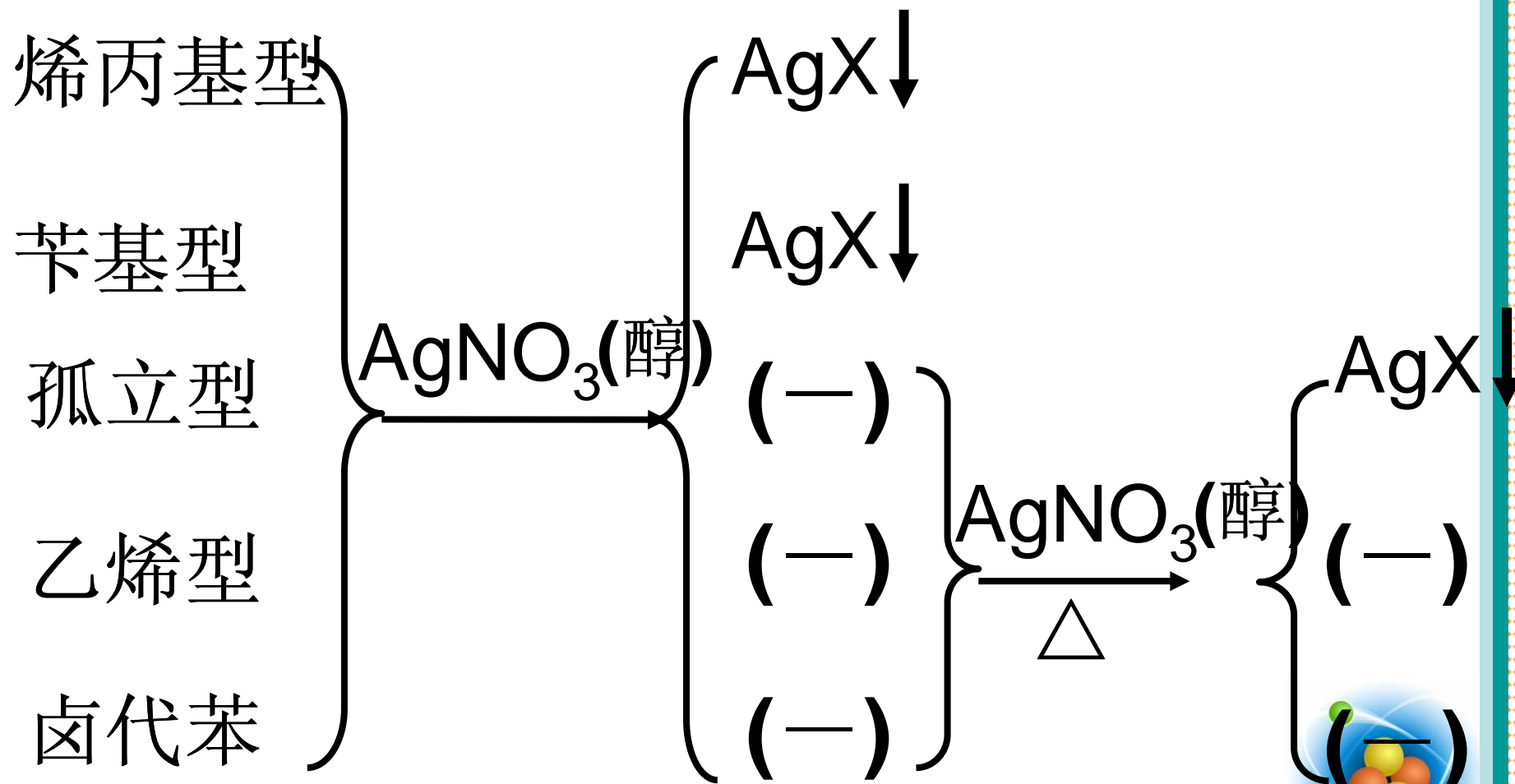


举例：



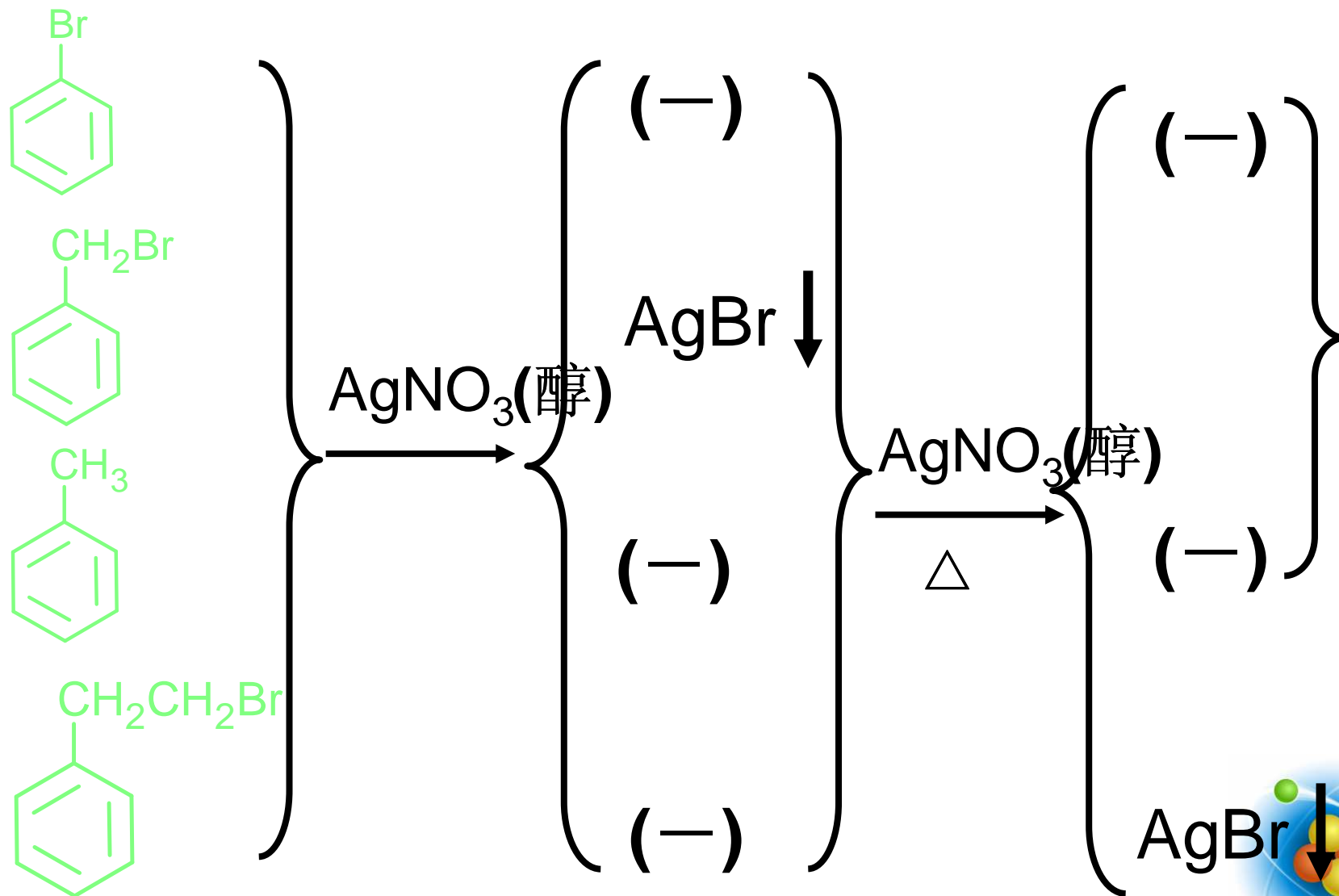


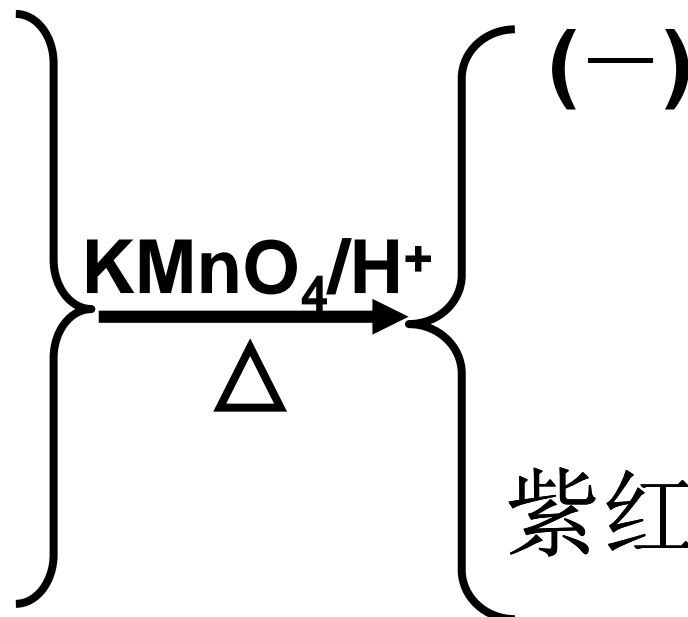
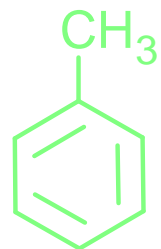
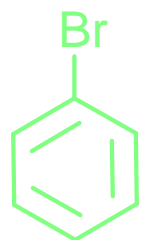
不同卤代烃与AgNO₃(醇)的反应





用简单的化学方法鉴别下列化合物：





紫红色褪去





The main chemical property of halohydrocarbon is nucleophilic substitution reaction. Because of the polarity of carbon-halogen bond in halohydrocarbon, the halogen atom of the bond leaves away from the molecule in the form of negative ion, while the nucleophilic reagent with rich electron replaces it.





The halogen that connects directly with unsaturated carbons in halohydrocarbon shows very low activity in nucleophilic substitution reaction. When it connects with a saturated carbon, its activity of reaction will increase. When it connects with benzyl group or allyl group, its activity of reaction increases greatly.





Under certain conditions, the nucleophilic reagent in the strong alkaline solvent attacks the β hydrogen instead of the α carbon so as to result in the elimination reaction of halohydrocarbon.





Exercises: (Page 117)

1、 (2) (8)

2、 (2) (4) (6)

4、 (1) (2) (3) (5) (8)

8、 (2) (3) (4)

11、 (2)

12、

